the thermometer rose to 0°, but *never exceeded that point;* when not, the bulb of the thermometer, by the volatilising of the ice, was partly laid bare. As it appears by the detailed description of Dr. Carnelley's experiments in NATURE, vol. xxiii. p. 341, that the success depends for a great part on the size of the condenser, we have made another apparatus with a condenser of half a litre; the results we may obtain therewith will be related shortly.

We have also made some experiments on naphthalene. The pressure of the naphthalene vapour at the melting-point, nearly 80°, being ± 9 mm., as was found by a preliminary proof, it was expected that it would not be very difficult to obtain and to maintain a vacuum sufficient to observe the demeanour of naphthalene under similar circumstances as ice. The apparatus we used resembles in its principal features that we made use of in experimenting on ice; alone, the condensing surface was much greater. The thermometer bulb being imbedded in a cylinder of pure naphthalene 13 mm. in diameter, the thermometer was fixed in the axis of the glass tube, and this latter drawn out. A small quantity of water being brought in the tube, the pressure was reduced by means of an ordinary air-pump to 5 mm., and the drawn-out end of the tube melted through. In another instance the tube was several times filled with carefully-dried carbonic acid and exhausted, and lastly, when the pressure had been reduced to 7 mm., sealed. To remove the remaining carbonic acid and aqueous vapour a certain quantity of caustic potash and some pieces of oxide of calcium were inclosed in the tube. In what manner the tube had been prepared, the results when heat was applied, the upper part of the tube being cooled in a freezing-mixture or simply in snow, were always the same. The thermometer rose very rapidly to about 79°, and *stayed at that point* as long as no part of the thermometer bulb was denuded of naphthalene. At the same time the naphthalene sublimed very regularly, covering the sides of the tube next to the heated part with a beautiful layer of naphthalene crystals.

C. J. E. BRUTEL DE LA RIVIERE
A. VAN HASSELT

Assen (Netherlands), April 14

Sound of the Aurora

THE interesting communications which have lately appeared in your periodical regarding the supposed connection between "sound" and the "aurora" (NATURE, vol. xxiii. pp. 484, 529, 556), lead me to suppose that the following notes may be considered by you and your readers worthy of record. They were copied last autumn by myself from the Strangers' or Visitors' Book at the Hotel on the Æggischorn, and bore the date July 10, 1863:—

"Visit to the Col de la Jungfrau described: On descent surrounded by thunderclouds evidently charged with electricity. At 12.15 a sound similar to that made by a boiling kettle was heard to issue from one of the alpenstocks, and very soon a similar sound issued from all the bâtons. On shaking the hands similar sounds issued from the fingers. Observing that the veil of one of the party stood upright on his hat, one of the gentlemen and one of the guides, who had experienced prickly sensations on the crown of the head, removed their hats, when their hair stood up as if under a powerful electrical machine. Whenever there was a peal of thunder all of the phenomena ceased, to be speedily renewed when the peal was over. At such times all the members of the party felt severe shocks in the parts of the body which were most affected; and one gentleman had his right arm paralysed and rendered useless for several minutes. The clouds passed away and the phenomena finally ceased at 12.30. The guides with us were Joseph Marie Claret of Chamouni, and Smith of this house, and they were as much affected by the electricity as we were. At the top of the Col the aneroid barometer stood at 18·83."

I believe the above statement, clear and pointed as it is, was signed by the names of Watson, Sowerby, and Adams.

It will be seen that other phenomena are mentioned, in addition to the sounds heard in connection with the electrical ones, which are worthy of regard. I would, among other points, draw attention to the effect produced on the arm of one of the travellers, and should be glad to know from any of your correspondents whether they have met with other like results of electrical interference with the actions of muscles in mountain travelling.

I may mention in passing that in the same Visitors' Book at the Æggischorn Inn I found notes to the effect that the Jungfrau and the Aletschorn were first ascended by a lady in August of the year 1863.

JOHN W. OGLE

30, Cavendish Square, W.

A PRESUMPTION as to the true character of the sound of the aurora is perhaps offered by the fact that to many persons a flash of lightning is accompanied by a distinct *whishing* sound. As this is simultaneous with the flash, and therefore evidently subjective, it seems to offer evidence merely of the close connection existing between the senses of seeing and hearing.

April 30

E. HUBBARD

Symbolical Logic

IN my recent letter on Symbolical Logic (see NATURE, vol. xxiii. p. 578) I said that Prof. Peirce's symbol of inclusion, as defined by him in his "Logic of Relatives," was equivalent to the words "is not greater than." This however is not quite correct; for though Prof. Peirce speaks of this symbol as equivalent to the words "is as small as," he also speaks of it as denoting "inclusion," and his illustration $f \mathrel{-\!\!<} m$ may be read, *The class f is included in the class m.* In my notation the analogous composite symbol $f : m$ may be read, *The statement f implies the statement m.* If for f in my notation we read *He belongs to the class f,* and for m we read *He belongs to the class m,* then my $f : m$ will coincide in meaning with Prof. Peirce's $f \mathrel{-\!\!<} m$; but this does not alter the fact that my f differs in meaning from his f, that my : differs from his $\mathrel{-\!\!<}$, and my m from his m. Mr. Venn, in his recent paper in the *Proceedings* of the Cambridge Philosophical Society, speaks of these distinguishing features of my method as unimportant, and he regards my definitions of my elementary symbols as "arbitrary restrictions of the full generality of our symbolic language." But Mr. Venn overlooks the fact that all accurate definitions are more or less arbitrary restrictions of language, and he also seems to me, in this particular case, to mistake *vagueness* for *generality.* Philosophical investigations that begin with *Let* x = *anything* commonly end with x = *anything*, a result which, whatever may be thought of its generality, does not add much to our knowledge.

HUGH MCCOLL

73, Rue Siblequin, Boulogne-sur-Mer, April 26

The Formation of Cumuli

THIS afternoon the air to a great distance above the surface of the earth has been filled with fluttering dry leaves. For some weeks no rain has fallen in this vicinity, and a cold northerly wind has prevailed. To-day, for the first time during the continuance of this cold and rather clear weather, the hill-sides having a southern exposure have begun to be sufficiently warmed to cause upward currents of air along their surface. The effect has been curious: piles of cumuli have formed persistently in certain quarters of the sky, and eddying masses of leaves caught up along the hill-sides have been falling apparently from the under surface of the dense masses of cloud. My attention was first caught by the fall of chestnut and other varieties of leaves, which must have traversed a long distance, as there are no trees of the sort near at hand in the direction from which the wind was blowing at the time. Whilst walking near an elevated ridge of ground an hour later it was my fortune to catch sight of a thick mass of leaves rushing directly up its side and pouring apparently into the bosom of a dark cloud which overhung the hill. This cloud remained almost stationary, although there appeared to be a lively breeze along its under surface, the leaves darting forward very swiftly. The entire phenomenon was quite interesting as affording an illustration of the method of formation of clouds of the variety named.

M. A. VEEDER

Lyons, New York, March 20

"The Oldest Ocean Post Office"

IN NATURE, vol. xxiii. p. 254, just received here, it is stated that in Magellan Straits there has been for some years past, chained to a rock there, a barrel from which passing ships take letters for the direction they are going in, leaving others for the opposite quarter; it is added that up to the present no abuse of the privileges of this primitive post-office has been reported.

© 1881 Nature Publishing Group

In Victor Hugo's romance, published in English, some fifteen years ago, as "The Toilers of the Sea," a tale of the first quarter of this century, he makes one of his sailors tell another about such an "Ocean Post Office" at Cape Famine in Magellan Straits. Cape Famine was the scene of an early settlement which—in that bleak place—was entirely dependent on the outside world for means of subsistence, and when these, on one occasion, failed, through delay in the arrival of a ship, the colonists died; the circumstance giving the place its present name. The existing colony in Magellan Straits, about twenty miles from Cape Famine, is a Chilian settlement called Punta Arenas, or Sandy Point. Its trade is in guanaco and emu skins, brought to it by the Patagonian Indians. The colonists do a little also in agriculture, coal-mining, and gold washing.

Sailing-ships invariably now go round Cape Horn; the narrowness of the Straits at some points, their strong currents, and the alternating fogs and wild winds that prevail making the passage a very risky one for such vessels as are now employed in ocean navigation. There are however two steamship companies, a Liverpool and a Hamburg one, whose vessels pass through the Straits, and, touching at Sandy Point, insure nearly weekly communication between that place and the east and west. But the oldest commanders of these steamers know of no such institution as an ocean post office in Magellan Straits. Indeed at Sandy Point there have long been the usual facilities for postage, and the plan of the barrel is therefore not needed in the Straits.

That plan is adopted in "Post Office Bay," in one of the uninhabited Galapagos Islands, and possibly that fact, or the adoption of some similar device in the Straits at a time, long ago, when there was no settlement there, and of which a tradition may still remain, may have suggested Victor Hugo's narrative, which again may have been the origin of the paragraph quoted in your columns. ARCH. ROXBURGH

Valparaiso, March 23

JOHN DUNCAN, THE ALFORD WEAVER-BOTANIST

THE subscriptions spontaneously sent for the purpose of forming a fund to raise this deserving old botanist above the need of accepting parochial relief have now reached the handsome sum of 322*l.* 19*s.* 10*d.* Of this sum there were sent through NATURE 73*l.* 6*s.* 9*d.*; to Mr. Jolly, Inverness, 223*l.* 10*s.* 10*d.*; to Alford direct, 90*l.* 19*s.* 7*d.*; through the *Free Press*, Aberdeen, 12*l.* 9*s.*; and through the *People's Journal*, Aberdeen, 1*l.* The names of the subscribers to the NATURE Fund have already been published here. The list of the others is much too long to be inserted, the very length showing the wide-spread interest excited by the case. It includes above 300 separate subscriptions, ranging from 30*l.* from Mrs. Alfred Morrison of London, to 1*s.* from a working man and from a child botanist, and the names of many of our most eminent scientists. Some interesting details might be given of the warm sympathy expressed in the case; the wording of special subscriptions, some large sums from nameless donors, and the plans adopted by different persons in different parts of the country interested in the old botanist, to gain the help of the generous: but want of space prevents these being entered on. One item deserves mention, namely, the interest manifested in the case by several scientific societies already mentioned in NATURE; though it must be added that the absence of the names of some societies especially devoted to Botany, and of the University of Aberdeen, which received the gift of John's herbarium, is not a little strange. The action of these generous societies is no doubt a not unimportant means of assisting scientific inquiry and "endowing research." As already stated, Her Majesty was graciously pleased to present a gift of 10*l.*

A trust-deed has now been formally executed and signed by John Duncan, disposing of the money thus subscribed, and his books and other possessions, during his life and after death, vesting all powers, with certain discretionary liberties, in seven trustees, provision being made for their permanent continuance. These trustees consist of Mr. William Jolly, H.M. Inspector of Schools, Inverness, whose sketch of Duncan in *Good Words* in 1878 first drew attention to the old man, and whose recent appeal in his behalf has resulted in the present ample provision for his comfort, Mr. Farquharson of Haughton, near Alford, chairman of the School Board of Alford, the Rev. Mr. Gillan, and the Rev. Mr. Brander, the Established and Free Church clergymen of Alford, and three other gentlemen personally interested in Duncan; the permanent trustees of his property, if any remain, to be the ministers of the Established and Free Churches of Alford and the Chairman of the School Board of Alford, with power to add to their number, so that the full number shall never be under five. It is provided, that he agrees to the provision made for him during his life, which is ample, and that whatever sum remains at his death shall be vested in safe securities and the interest arising therefrom devoted to the foundation of scholarships or prizes for the promotion of science, especially Botany, in schools in certain parishes named, in the Vale of Alford; his books, which are numerous and good, especially those on Botany, being gifted to the parish of Alford, for the same object. Meantime the greater part of the money in hand will be invested at good interest.

It must be gratifying to the subscribers to know that not only will the comfort of the old botanist be secured for the remainder of his life, but that any surplus, which is almost certain to be considerable, will promote for all time the pursuit of those studies that have made Duncan famous, among the children, male and female, of the district in which he has achieved his own scientific work. The worthy man, now in his eighty-seventh year, is frail, and the past severe winter has been hard upon him, as upon all aged people; but he may, and probably will, survive for some years to come. His gratification and gratitude at the kindness recently shown him are expressed with childlike depth and sincerity. Any remaining subscriptions offered should be sent without delay to Mr. Jolly, Inverness, in order that all requisite arrangements may be completed.

ELECTRIC LIGHTING

I.

ONE of the greatest experiments ever made in street illumination by means of the electric light was commenced on March 31 in the City of London. The enterprise of the City authorities in this direction is the more commendable, inasmuch as they had previously tried electric lighting on the Holborn Viaduct and in Billingsgate Market with very poor success. In fact, in these two instances the experiment was a decided failure.

Now however, gaining experience from the advances that have been made in other directions, and especially from the great success attending the illumination of several railway stations, the City authorities determined to divide the City into three districts for the purpose of experiment.

1. The London Bridge district: embracing London Bridge, Adelaide Place, King William Street, the front of the Royal Exchange and Mansion House, the Poultry, a part of Cheapside as far as King Street, the upper part of Queen Street, King Street, and the Guildhall Yard.
2. The Blackfriars Bridge district: embracing Blackfriars Bridge, New Bridge Street, Ludgate Circus, Ludgate Hill, St. Paul's Churchyard (north side), and the remaining portion of Cheapside beyond King Street.
3. The third district has not been lit up, and therefore we need not refer to it.

The first district is being lit up by Messrs. Siemens Brothers at a total cost of 3725*l.* for the twelve months, replacing 138 gas-lamps. The other district has been lit up by the Anglo-American Electric Light Company, on the Brush system, for a total cost of 1410*l.*, replacing 150 gas-lamps.

© 1881 Nature Publishing Group